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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/567,389

07/11/2008

Robert Engel

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EXAMINER

HEINCER, LIAM J

ART UNIT

PAPER NUMBER

1767

MAIL DATE

DELIVERY MODE

12/22/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/567,389	Applicant(s) ENGEL ET AL.	
	Examiner LIAM J. HEINCER	Art Unit 1767	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/9/10.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 26-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25, 30, and 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 4 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for acrylic polymers having carboxyl groups, does not reasonably provide enablement for polymers of any of the claimed acrylates. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims. The original specification teaches that the positively charged moiety is attached to the polymer via a carboxyl group (2:3-22). Additionally, the method of making the compounds of claim 1 requires the polymer to have a carboxyl group (12:20-13:12). Finally, the examples all use carboxyl functional polymers in the preparation of the claimed compound. However, claim 4 recites that the polymer can be a homopolymer of a monomer that does not contain a free carboxylic acid group. Additionally, a multitude of copolymers fall within the scope of claim 4 that do not contain carboxylic acid groups. It would require undue experimentation on the part of a person having ordinary skill in the art at the time of invention to attach the claimed charged moiety to these polymers absent any teaching in the original specification on how to accomplish this task.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

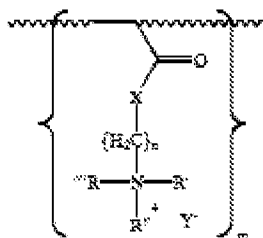
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4-8, 10, and 14-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Perrault et al. (US Pat. 6,039,940).

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Considering Claims 1, 4-8, 10, and 14-17: Perrault et al. teaches an antimicrobial polymer (Title)



having the structure where n is 2 or 3, R' , R'' , and R''' are C_{1-16} alkyl, aryl arylamine, alkylamine, alkaryl or arakyl, m is greater than 50,000 and y is a counterion (claim 1).

Considering Claim 18: Perrault et al. teaches the counter ion as being a halide or sulfite (Claim 10).

Considering Claim 19: Claim 6, from which claim 19 depends, requires R^2 to be $-H$. As R^3 , R^4 , and R^5 are only present in embodiments where R^2 is not $-H$, the instant claim limitations further limiting R^3 , R^4 , and R^5 does not provide patentability to the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

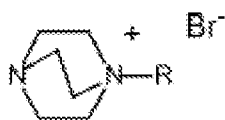
Claims 1-3 and 5-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Namikoshi et al. (US pat. 4,877,617) in view of Abel et al. (Carbohydrate Research 337 (2002) 2495-

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2499) as evidenced by Cohen et al. (Tetrahedron Letters 39 (1998) 8617-8620) and Hardy (US Pat. 6,022,556).

Considering Claims 1-3, 5-7, 10, 12-18, 20-25: Namikoshi et al. teaches a carboxyl functional polysaccharide that is preferably alginic acid that has been reacted with a quaternary ammonium compound (2:40-3:2). Namikoshi et al. teaches the alginic acid as having a molecular weight of 10,000 to 500,000 (3:48-55).

Namikoshi et al. does not teach covalently bonding the quaternary ammonium compound with the alginic acid. However, Abel et al. teaches covalently attaching a quaternary ammonium compound to a polysaccharide (pg. 2495). Abel et al. teaches the quaternary ammonium compound



as being where R is a straight chain alkyl having 8 to 18 carbon atoms (pg. 2496).

Cohen et al. teaches that these compounds can be further functionalized with alkylhydroxy groups (pg. 8617) and Hardy teaches that alcohols will react with alginic acid to form ester groups (abstract). Office personnel may also take into account “the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 550 U.S. at ___, 82 USPQ2d at 1397. See MPEP §2141. A person having ordinary skill in the art at the time of invention would have used the methods described in the prior art to attach functional groups that will react with the carboxylic acid groups of the polysaccharide.

Namikoshi et al. and Abel et al. are analogous art as they are concerned with the same field of endeavor, namely polysaccharides functionalized with quaternary nitrogens to provide antimicrobial properties. It would have been obvious to a person having ordinary skill in the art at the time of invention to have covalently bonded the compound of Abel et al. to the polysaccharide of Namikoshi et al., and the motivation to do so would have been, as Abel et al. suggests, covalent bonding prevents dissociation of the quaternary ammonium compound (pg. 2495) and the compounds of Abel et al. are not consumed during use (pg. 2497).

Considering Claims 8, 9 and 11: Namikoshi et al. and Abel et al. are silent towards whether all the R or R¹ groups are the same or a mixture. However, the references teach a range of alkyl groups that can be used for variables. “It is *prima facie* obvious to combine two compositions each of which is

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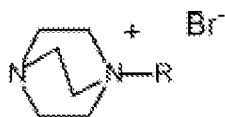
taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art.” *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980). It would have been obvious to a person having ordinary skill in the art at the time of invention to have used a mixture of compounds with different numbers of carbon atoms in the hydrocarbon chains as they are both taught to have utility in antimicrobial compounds.

Considering Claim 19: Claim 6, from which claim 19 depends, requires R^2 to be -H. As R^3 , R^4 , and R^5 are only present in embodiments where R^2 is not -H, the instant claim limitations further limiting R^3 , R^4 , and R^5 does not provide patentability to the claims.

Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Namikoshi et al. (US pat. 4,877,617) in view of Abel et al. (Carbohydrate Research 337 (2002) 2495-2499) as evidenced by Cohen et al. (Tetrahedron Letters 39 (1998) 8617-8620) and Hardy (US Pat. 6,022,556).

Considering Claim 30: Namikoshi et al. teaches a carboxyl functional polysaccharide that is preferably alginic acid that has been reacted with a quaternary ammonium compound (2:40-3:2). Namikoshi et al. teaches the alginic acid as having a molecular weight of 10,000 to 500,000 (3:48-55).

Namikoshi et al. does not teach covalently bonding the quaternary ammonium compound with the alginic acid. However, Abel et al. teaches covalently attaching a quaternary ammonium compound to a polysaccharide (pg. 2495). Abel et al. teaches the quaternary ammonium compound



as being

where R is a straight chain alkyl having 8 to 18 carbon atoms (pg. 2496).

Cohen et al. teaches that these compounds can be further functionalized with alkylhydroxy groups (pg. 8617) and Hardy teaches that alcohols will react with alginic acid to form ester groups (abstract). Office personnel may also take into account “the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 550 U.S. at ___, 82 USPQ2d at 1397. See MPEP §2141. A person having ordinary skill in the art at the time of invention would have used the

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methods described in the prior art to attach functional groups that will react with the carboxylic acid groups of the polysaccharide.

Namikoshi et al. and Abel et al. are analogous art as they are concerned with the same field of endeavor, namely polysaccharides functionalized with quaternary nitrogens to provide antimicrobial properties. It would have been obvious to a person having ordinary skill in the art at the time of invention to have covalently bonded the compound of Abel et al. to the polysaccharide of Namikoshi et al., and the motivation to do so would have been, as Abel et al. suggests, covalent bonding prevents dissociation of the quaternary ammonium compound (pg. 2495) and the compounds of Abel et al. are not consumed during use (pg. 2497).

Considering Claim 31: Namikoshi et al. does not teach the ammonium compound as having one of the claimed leaving groups. However, Abel et al. teaches that hydroxyl groups can be activated with tosylate groups (pg. 2496). It would have been obvious to a person having ordinary skill in the art at the time of invention to have activated the hydroxyl groups of the ammonium compound, and the motivation to do so would have been, as Abel et al. suggests, increased the reactivity of the hydroxyl group.

Response to Arguments

Applicant's arguments filed December 9, 2010 have been fully considered but they are not persuasive, because:

A) The applicant's argument that the specification provides abundant guidance to the skilled artisan seeking to derivatize acrylic polymers is not persuasive. The citation relied upon by the applicant is only concerned with oxidized cellulose. The Office agrees that the original specification provides support for oxidized cellulose as the polysaccharide polymer. However, the claim at issue is not directed towards the polysaccharide embodiment. Further, the claim does not require the acrylic polymer to be derivatized to have a carboxylic acid group. The issue with the enablement rejection is that the acrylic polymers of claim 4 are not required to include carboxylic acid groups. The rejection would be overcome by adding a limitation requiring the carboxylic acid groups be present. This would appear to be in line with the applicant's arguments.

B) The applicant's argument that Perrault et al. does not teach a divalent hydrocarbon radical for R is not persuasive. Perrault et al. teaches that R is $[\text{CH}_2]_n$ where n is 2 or 3 (claim 1). This

spacer is an ethylene or 1,3-propylene spacer. These are preferred species of the R group in the instant application (see original claim 7). Therefore, Perrault et al. does in fact teach the claimed divalent hydrocarbon group.

C) The applicant's argument that there is not a reasonable expectation of success is not persuasive. Namikoshi et al. teaches a carboxylic acid containing polysaccharide that is desirable for attachment with ammonium group containing substituents. Abel et al. teaches an ammonium containing group, that is desirably attached to a polysaccharide. The modifications to the compound of Abel et al. that would allow for attachment to the carboxylic acid group of the polysaccharide are known in the art, as evidenced by Cohen et al. and Hardy, and as they are well explained in Cohen et al., well within the skill of a person having ordinary skill in the art at the time of invention.

D) In response to applicant's argument that there is no teaching, suggestion, or motivation to combine the references, the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007). In this case, it would have been obvious to a person having ordinary skill of the art to have covalently bonded the compound of Abel et al. to the polysaccharide of Namikoshi et al., and the motivation to do so would have been, as Abel et al. suggests, covalent bonding prevents disassociation of the quaternary ammonium compound (pg. 2495) and the compounds of Abel et al. are not consumed during use (pg. 2497).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be

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calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIAM J. HEINCER whose telephone number is (571)270-3297. The examiner can normally be reached on Monday thru Friday 7:30 to 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo/

Supervisory Patent Examiner, Art Unit 1767

LJH

December 14, 2010